TECHNOLOGY DEPT

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July 18, 1953

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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

Rare Swamp Monkeys

See Page 40

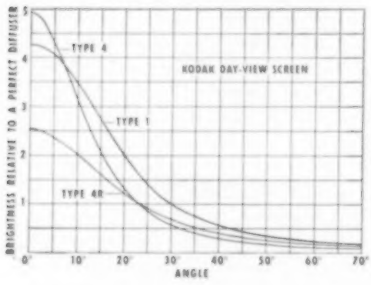
A SCIENCE SERVICE PUBLICATION

Kodak reports to laboratories on:

special screens for rear projection . . . a roundup of materials for color photography . . . our ambitions in the organic chemical business

Rear projection

Any intelligent schoolboy knows that to look at a projected real image up close without getting in the way of the beam you catch the image on a diffuser like a ground glass. As the schoolboy grows into an optical engineer, he learns that a) the better the diffusion the more light is likely to be wasted into space where there are no eyes to profit from it and b) ground glass really doesn't diffuse very well, being prone to a "hot" center and



dark corners for the image. As the engineer pursues the subject, he gets involved in the theory of field lenses, the light economy of high overall transmission, the contrast-enhancing value of light-absorbing material to counteract ambient illumination, the question of graininess, and the matter of over what angle the image is to be seen. Eventually he hears about Kodak Day-View Screens, a light-scattering dispersion in gelatin on glass.

Type I is white, of high transmission, with twice as much light transmitted at 30° as ground glass transmits. Type IV is rather black, which improves contrast substantially at high (but not at low) ambient levels. Type IVR is green, which is supposed to be more restful to the eyes in constant use. The curves above give brightness *vs.* angle on a scale where unity represents the reflectance of a perfect diffuser.

Looking at the curves may be of some help, but it's no substitute for actually trying the three types of screens in any application you may have in mind. If seriously interested, write Eastman Kodak Company, Special Products Sales Division, Rochester 4, N. Y.

Color

A color photograph speaks more eloquently than one in black-and-white. Here, then, is a rundown of the products we offer for imparting this eloquence and the additional informational capacity it adds to photography.

Kodachrome Film everybody knows about. Comes in 16mm and 8mm for movie cameras and 35mm for still cameras. "You press the button, we do the rest"—our old slogan.

Kodacolor Film is for roll film cameras. We process to a negative without additional charge, and then from your Kodak dealer you order prints or enlargements. No projection, no holding up against the light.

Beyond these two that are familiar to millions of amateurs there is *Kodak Ektachrome Film.* It comes in roll and sheet film form, and you (or a local lab) convert it to a transparency. If you'd rather have a print to look *at*, we can make you a *Kodachrome Enlargement*, provided your original is 4″ x 5″ or less. If it's larger, we suggest a print by the *Kodak Dye Transfer Process.* This you can undertake yourself or leave to a commercial laboratory for a creation of smashing visual impact.

(If smashing visual impact is more important to you than strict objectivity, you can work the *Kodak Flexichrome Process.* This starts from any good black-and-white negative and allows you to assign the colors by hand.)

Finally, if you'll be wanting several duplicates at minimum cost, particularly of exhibition size and with the color brilliance so easily achieved in a transparency, make your original negative on *Kodak Ektacolor Film* and your duplicates on *Kodak Ektacolor Print Film.*

Your Kodak dealer sells all these items and also the Kodak Color Handbook (*$4*) *that delves deeply into the details. Write Eastman Kodak Company, Rochester 4, N. Y., if you have any difficulty finding out what you want to know.*

Ambition

Tie a pair of benzene rings together, replace one of the end hydrogen atoms with a fluorine atom, and what have you got? You've got a compound known as *4-Fluorobiphenyl*, and what the use of it can be is a matter that, frankly, does not concern us much. Any singularly useful properties it may have are apparently not well known, for our inventory of the compound, pictured below in its entirety, seems to be well balanced to the world's present needs. It is a representative of our group of fluorinated aromatics—poor relations (so far) of the currently booming family of fluorinated aliphatics. It isn't that we bet on the wrong horse when we began making fluorobenzene and the three fluorotoluenes some 20 years ago. We don't figure that way. We do figure that here is one more group of organic compounds that an interested investigator, whenever he turns up, can count on us to have in stock for him. This

sounds incredibly public-spirited, but it just happens to be the nature of our Eastman Organic Chemicals business.

4-Fluorobiphenyl (*Eastman 6170*) *is just one of many hundreds of such examples citable from the list of more than 3500 compounds in List No. 38 of Eastman Organic Chemicals. A copy (if you haven't one at hand) is available without charge from Distillation Products Industries, Eastman Organic Chemicals Department, Rochester 3, N. Y. (Division of Eastman Kodak Company).*

This is one of a series of reports on the many products and services with which the Eastman Kodak Company and its divisions are . . . *serving laboratories everywhere*

Kodak
TRADE-MARK

BOTANY

Algae To Feed Starving

Feeding of world's future populations by "educated" algae foreseen in first report on Carnegie Institution's investigation of the cultivation of one-celled plants.

► FUTURE POPULATIONS of the world will be kept from starving by production of improved or "educated" algae, related to the green scum on ponds.

These one-celled plants can provide food high in the protein which is in shortest world supply. Algae can utilize sunshine and air more efficiently than any living or mechanical process.

This is forecast in the first comprehensive report on a far-flung investigation on algal culture by the Carnegie Institution of Washington.

"The need of the world for additional sources of high-protein food is so great, especially in over-populated areas, that serious effort in tracking down every promising lead is certainly warranted," Dr. Vannevar Bush, president of the Carnegie Institution, explained.

"Such great advances in technology have already come from the coupling of engineering with biology that it seems inevitable that the production of food, at least in certain areas, will eventually be carried out by 'process' industries. The large-scale culture of algae may well become the first of them.

"In regions of the world where population is especially dense, and fertile land is limited, it is entirely possible that process-industry methods of producing food may furnish a respite from the threat of famine and so contribute toward more salutary conditions for civilized living. If algal culture can serve such a purpose, it is well worth development for that reason alone.

"It is hoped that such a development may take the form ultimately of a multitude of individually owned, relatively small establishments, combining the culture of algae perhaps with utilization of the product for animal feeding on the spot.

"The new industry that would result would thus enter into our economic life in such a manner as not to produce disruption, but rather to strengthen individual enterprise."

The first large-scale use of cultivated algae as human food took place in Venezuela a decade ago when lepers were fed successfully soup made from algae, the report reveals for the first time.

For centuries oriental peoples have eaten seaweeds, which are large-sized algae, and some are considered a delicacy. Scientists have been confident that some kinds of microscopic algae will be suitable and acceptable as human food.

From two pilot-plant productions of algae, one in Cambridge, Mass., and the other in Japan, *Chlorella* algae powder has been sampled for taste and palatability. American experiments showed that *Chlorella* alone is too strong in flavor for one to enjoy eating large quantities of it, but it is pleasing as a garnish. It can be added up to 15% to a chicken-base soup successfully. Japanese reported that their product tastes like dried seaweed or powdered green tea, both popular in Japan.

Algae are expected to become an industrial raw material for protein, fat, vitamin or even antibiotic content. Moreover, experiments are in progress to find strains of algae that will have special qualities for food and other uses. There are about 17,000 different species.

The primitive character of the cells of microscopic algae is such that they are practically all food, without the waste present in stems, roots and leaves of higher plants. Dried cells are often more than half protein, more than in any higher plants. Algae can be made to produce a continuous crop regardless of weather and time of year.

In the larger scale tests, algae have been grown in plastic tubing exposed to sunlight, with nitrogen fertilizer and concentrated carbon dioxide supplied. Full, continuous sunlight does not produce the most efficient results, for each green alga cell must have intermittent light and can utilize in photosynthesis only a limited amount of light energy at a time. Turbulent flow of the growing culture will be tried to produce the best conditions.

Plans are being made, it is stated in the report, which is edited by John S. Burlew, to build a demonstration plant covering about an acre when some of the problems discovered in the experimentation so far have been solved.

Science News Letter, July 18, 1953

MEDICINE

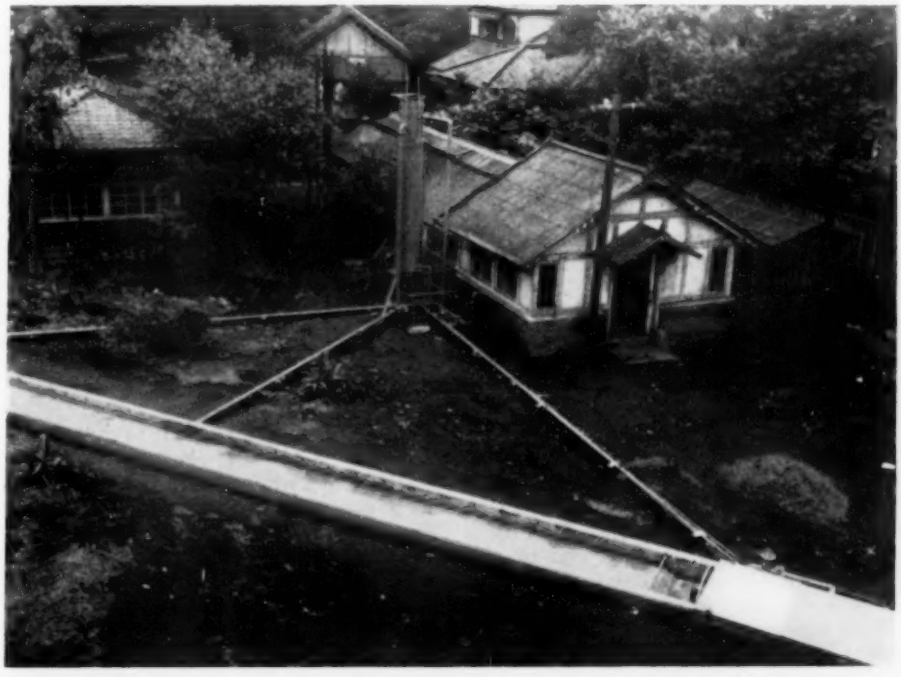
Drug Over Half Gold for Rheumatoid Arthritis

► A DRUG containing 54% gold can treat rheumatoid arthritis effectively, especially in the early stages of the disease, a New York physician, Dr. Robert C. Batterman, reports in the *Journal of the American Medical Association* (July 11).

Using an improved form of organic gold compound, aurothioglycanide, over an eight-year period, Dr. Batterman found that gold therapy, which in pre-cortisone days had been criticized for slowness in producing improvement and for toxicity, is suitable for use even since cortisone and ACTH have been discovered.

In 56% of his patients with early arthritis, the gold compound gave complete remission or major improvement. The treatment is less toxic than any other available gold compounds.

Science News Letter, July 18, 1953



***PRE-PILOT-PLANT EXPERIMENTS**—A general view of the culture unit built on a pre-pilot-plant scale by the Tokugawa Institute for Biological Research, Tokyo, to obtain information concerning large-scale algal culture.*

STATISTICS

One-Way Street Outlook

➤ ONE-WAY STREETS seem to boost business.

Although this is not an iron-clad rule, reports from the District of Columbia and Sacramento, Calif., show that one-way traffic is going over big with businessmen on both coasts.

Not only do one-way streets sometimes jack up trade in shops, filling stations and department stores along their edges, but they also produce more safety as a by-product. This safety is shared by motorists and pedestrians at the temporary expense of city morticians.

Business is clipping along about as usual on two downtown streets in the District of Columbia recently changed to one-way lanes. Elsewhere in the nation's capital, the pulse of trade is throbbing a little more slowly than before the elections.

Sales-tax returns of merchants along Tenth and Twelfth Streets, Northwest, reveal business has remained good since work crews put up the one-way signs Feb. 15.

Shortly after those car-clogged streets had been changed, merchants complained that their business had fallen off. But the complaints rapidly died out.

Sacramento officials, surveying reaction to their own one-way street experiments, report that local businessmen seem pleased. Groups of them now are prodding city officials to expand the one-way street system.

Business in downtown Washington generally has undergone a slight recession since the election, reports John Mitton, District traffic engineer. But tax records show merchants along the new one-way streets are "as well off or better off" than they were a year ago.

The cause of this business "boom" baffles Mr. Mitton. More parking spaces usually can be sandwiched in along one-way streets. This usually stimulates business in nearby stores. But so far the District's traffic department has not changed a thing on the streets except the direction of traffic. No extra parking has been provided.

Sacramento's study turned up some of the safety aspects of one-way streets. Seemingly a benefit to pedestrians, shopkeepers and motorists alike, they:

1. Boosted traffic volume 14%.
2. Cut the vehicle accident rate 15.5%.
3. Slashed pedestrian accidents 61.9%.
4. Raised traffic speed 24.4% during peak rush hours and 41.4% during other hours.

Science News Letter, July 18, 1953

PSYCHOLOGY

Learning a Language

➤ YOU DO not need any special linguistic talent to learn a foreign language. Even a very high IQ is not necessary.

If you are as bright as the average white collar worker, you can learn to speak Russian or Chinese or Spanish with as much ease as the highbrow with an IQ of 200.

This is what Dr. William J. Morgan, psychologist of Aptitude Associates, Merrifield, Va., learned in a study of the progress made by government employees studying Russian at Georgetown University, Washington.

The person of average intelligence or a little better can keep up with the rest even under the pressure of a modern intensive language course. More important than being a genius is to have certain work habits or personality traits.

Here is what you need:

Interest and enthusiasm. Ability to work and get along with others, and ability to grasp instructions and plans. You must want to improve your work and be able to obtain results and get things done. You must have initiative, but you must be thorough and must not neglect details. Judgment and common sense help, too.

This nation will some day wake up to the importance of foreign languages in the effective conduct of our international policies, Dr. Morgan predicts.

When that day comes, linguistic scientists should be ready for a great rush of people who want to learn languages in a hurry. In preparation, Dr. Morgan urges an alliance between linguistic scientists and psychologists to conduct research so that they will be better able to predict just how much a particular student is capable of, and how this optimum performance can best be attained.

Science News Letter, July 18, 1953

ICHTHYOLOGY

Sport Fishing Object Of Intense Research

➤ SPORT FISHING is becoming a major concern of scientific research, as the number of sport fishermen continues to grow prodigiously, while dams, pollution and—some say—overfishing, plus a host of other factors, seem to be reducing the number of sport fish available.

A list of more than 500 scientific projects currently under way on the sport fishery of the continental and territorial United States has been compiled and published by the U. S. Fish and Wildlife Service in the 133-page bulletin, "Survey of Fishery Activities, 1953."

About a quarter of the projects are receiving financial assistance from federal funds, under the Dingell-Johnson bill for aid in fish restoration. The others are financed directly by state agencies, the Fish and Wildlife Service, Forest Service, universities and other scientific bodies.

Typical of the programs under way in sport fishery are research on fish migration, spawning habits, food sources, age and growth, and effects of pollution.

Management projects include weed control, rough fish control, construction and maintenance of public fishing lakes, increasing food supply, and improvement of watersheds to stabilize stream flow.

Science News Letter, July 18, 1953

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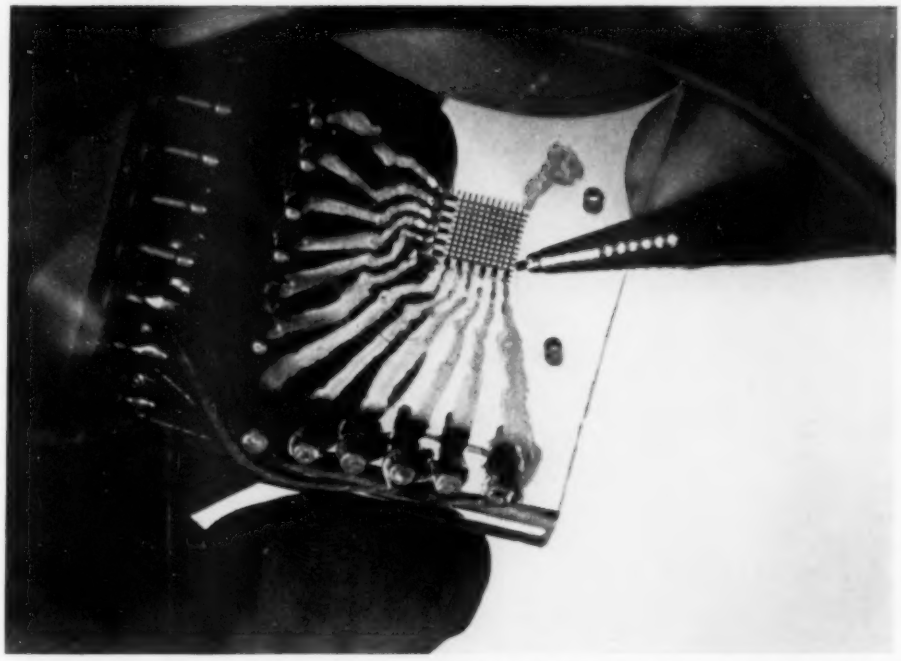

"MEMORY" CRYSTAL—Tiny crystals a few thousandths of an inch thick, made of barium titanate, can remember bits of information for an indefinite period. The fine electrodes carry the information, as electrical charges, to the crystals.

ELECTRONICS

Barium Titanate Crystals

➤ CRYSTALS OF barium titanate have been developed that can quickly memorize answers to 250 questions and spiel them off long afterward.

Developed by research scientists at the Bell Telephone Laboratories, the crystals help fill a need for remembering devices created by automatic machines. Only a few thousandths of an inch thick, the flat crystals receive tiny charges of electricity that represent answers the automatic machines will ask for later. A plus charge symbolizes "yes," a negative charge, "no."

Words, sentences or a series of numbers can be coded by using a large number of these symbols, just as the punched pattern in the old piano player roll can represent a piece of music.

Although the crystals may seem to have remarkable remembering power, they do not begin to approach the vast ability of the human brain. Electronic equipment approaching even imperfectly the capacity of the human brain would jam Grand Central Station with a maze of tubes, automatic switches, condensers, coils and wiring, it has been estimated.

The human brain, furthermore, can think. Crystals can only remember.

Remembering devices now used in telephone dialing systems require far more space than the equivalent system using barium titanate crystals. Because of this, telephone engineers believe the artificially grown crystals have great significance.

Barium titanate, a material with exceptional electrical behavior, was developed during World War II. When treated as a ceramic, or clay-like material, it resembles the porcelain of a kitchen sink. Scientists are particularly interested in the crystal form.

The sensitive atoms of barium titanate show a remarkably quick response to the slightest changes in pressure, temperature or electrical field. Even light, shining on a crystal of it, will cause the atoms to rearrange themselves.

Members of the Bell staff cooperating in the development of the crystals include J. R. Anderson and W. J. Merz.

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TECHNOLOGY

Silicone Rubber Coats Electric Wire

➤ WIRE AND cable insulated with silicone rubber have been approved by Underwriters' Laboratories for use in extreme temperature conditions. Silicone rubber insulation remains flexible at minus 60 degrees Fahrenheit, yet is satisfactory in most cases where temperatures soar nearly to 400 degrees Fahrenheit. General Electric's silicone insulation now is being used by Essex Wire Corp., Fort Wayne, Ind., to cover new types of wire and cable.

Science News Letter, July 18, 1953

TECHNOLOGY

New Detector Gives Iron the Bum's Rush

➤ TO MAKE sure that cows are fed hay—not baling wire, fence scraps, staples or broken machinery—three University of California agricultural specialists have invented an electronic system to give such tramp iron the bum's rush.

Chunks of metal can punch holes in the cow's second stomach, and can give the animal bovine traumatic gastritis, which farmers call "hardware sickness." These fatal bits of tramp iron often are fed to cattle in chopped hay.

John B. Dobie, Frederic C. Jacob and Leroy C. Kleist reported to the American Society of Agricultural Engineers in St. Joseph, Mich., that current tramp-iron removers, such as duct magnets, magnetic pulleys or air flotation schemes, do not seem to work well with hay or silage. The three agricultural experts decided to build a detector that could screen metal from hay.

Their device is an electromagnetic detector that reacts to bits of iron wire as small as one-half-inch in length shooting by a sensor coil as speeds of 10,000 feet a minute. A trap door about 20 feet down the pneumatic pipe snaps open in time to eject the metal from the hay.

Laboratory tests have revealed the method is "readily capable" of 99% effectiveness, or 100% with optimum adjustment. Although the detector still is in the experimental stage, the scientists predict it may be woven into farm machines of the future.

Science News Letter, July 18, 1953

ORNITHOLOGY

Moas Exterminated By Man Near 1300 A.D.

➤ THERE IS now more evidence that the moas, large flightless ostrich-like birds of New Zealand, were hunted to extermination by primitive men about 1300 A.D.

Food that was eaten those centuries ago and collected from the crop of a five-foot specimen of the *Dinornis* unearthed in a Pyramid Valley lake deposit gave this new clue.

A determination of its age as about 670 years ago was made by radiocarbon dating methods at Yale University by scientific team consisting of Monte Blau, Edward S. Deevey Jr. and Marsha S. Gross, reporting in *Science* (July 3).

A smaller species of moa, whose skeletons and even feathers have been found in early native campsites, existed when man came to New Zealand, but mystery has surrounded the date and cause of extinction of the larger *Dinornis* kind.

Radiocarbon is made in the upper atmosphere by cosmic rays transmuting nitrogen into the carbon form whose disintegration rate allows telling how old is any carbon-containing material.

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BIOCHEMISTRY

Radioactive Cortisone

Both cortisone and hydrocortisone have been labeled with carbon-14 for the first time. They will be used to study mechanism of their action against arthritis and cancer.

► RADIOACTIVELY LABELED cortisone, the anti-arthritis drug, is now being used to explore just how this medicine does its work.

Labeled with radiocarbon-14 for the first time, both cortisone, or compound E, and hydrocortisone, or compound F, have been produced by a cooperative procedure participated in by federal government, private research organizations and commercial pharmaceutical companies.

A new and important investigative tool, these special drugs will not be used primarily in treatment but in a detailed study of the mechanism of their action in arthritis, cancer and other metabolic diseases. Investigators can receive supplies by applying to the National Institutes of Health, Bethesda, Md.

Using a procedure for synthesis described by Drs. T. F. Gallagher, Theodore H. Kritchevsky and David L. Garmaise of the Sloan-Kettering Institute for Cancer Research, New York, Charles E. Frosst and Company, Montreal, Canada, with the help of the Upjohn Company of Kalamazoo, Mich., prepared the radioactive cortisone.

Dr. Gallagher previously had prepared radioactive cortisone marked with tritium and had reported on its administration to man. The work of Dr. Gallagher was supported in part by the Damon Runyon Memorial Fund. Technical difficulties in the use of the tritium-labeled cortisone made the synthesis of the carbon-labeled product most desirable.

The Upjohn Company carried out two essential reactions, a mold fermentation and a chemical step in the elaborate cortisone synthesis. The Worcester Foundation for Experimental Biology, Shrewsbury, Mass., utilizing radioactive progesterone prepared by the Frosst Company, biosynthesized the hydrocortisone by dissolving radioactive progesterone in blood and passing it through functioning adrenal glands of beef, after these had been removed from the animal. The U. S. Atomic Energy Commission provided the radioactive carbon with which the two hormones were made radioactive.

Both radioactive substances are labelled at position 4 with the carbon-14.

The preparation of these hormones was guided by a committee composed of Drs. Gallagher, Gregory Pincus of the Worcester Foundation for Experimental Biology, and Max Tishler of Merck and Co. The program was administered by the National Institutes of Health's endocrinology study section, of which Dr. Charles B. Huggins is chairman, and Dr. Sam R. Hall is executive secretary.

Essential technical knowledge and chemical intermediates were provided by members of the committee and others, notably Drs. Arthur Odell, formerly of Frosst, Carl Djerassi of Wayne University, H. G. Kolloff, R. H. Levin and D. H. Peterson of Upjohn, Harold Levy of Worcester Foundation, and George Rosenkranz of Syntex, S. A. Mexico.

Funds made available by the National Institute of Arthritis and Metabolic Disease, U. S. Public Health Service, make possible free distribution of the radioactive material for research purposes. Transfer and use of these materials are subject to current Atomic Energy Commission regulations.

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• RADIO

Saturday, July 25, 1953, 3:15-3:30 p.m. EDT

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Prof. William W. Havens Jr., associate professor of physics and director of Columbia University's Pupin Cyclotron Laboratory, will discuss "The Heart of Matter."

ASTRONOMY

Sight Periodic Comet On Its Return Voyage

► THE PERIODIC comet, Reinmuth (2), has been spotted about where astronomers predicted it would be on its return voyage through the sky.

Of the 19th magnitude, the comet is very much too faint to be seen except through a large telescope. It is in the constellation of Libra, the balance, low in the southern sky. It was found by astronomers at the McDonald Observatory, Mount Locke, Tex., and news of its discovery has been flashed to astronomers by Harvard College Observatory. The comet's path was predicted from observations made of its motion in 1947-48.

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AERONAUTICS

Frost Brushed Away

► WHILE THE nation swelters in mounting summer heat, scientists in the Air Force's giant climatic hangar at Eglin Field, Fla., must brush frost from the window panels of helicopters.

The 'copters, along with the nation's newest jet fighters, bombers and other military equipment, are being tested under weather conditions running the gamut from Sahara desert sandstorms to Arctic blizzards. Temperatures inside the hangar range from a blistering 160 degrees Fahrenheit to a frigid minus 65.

The tests are being run because machines "act up" under the onslaught of severe weather. Rubber hoses and tires shatter like glass at very low temperatures. Oil freezes into a mass that must be broken with an ice pick. Bulky B-17 bombers shrink two-tenths of a foot in length between a pleasant 75 degrees and a nippy 65 degrees below zero.

Air Force weather makers conjure up 100-mile-an-hour gales inside the hangar, throwing in a dash of sleet, snow, rain or sand for good measure. While this is going on, a complex electronic recording system swiftly gathers data from the plane, gun or jeep under test. From future studies of the data, scientists hope they can figure out why maintenance triples in severe Arctic weather.

Although the climatic laboratories are elaborate, they are economical. Frequently more can be learned about an airplane in the big hangar than in actual flight tests. Furthermore, tests can be conducted on several items at once.

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DEFROSTING HELICOPTER--Two U. S. Air Force technicians clean snow off the window panels of a helicopter after cold tests.

***PICK-UP FROM ICE**—Swooping down over the ice, a Coast Guard PBY makes an aerial pick-up of mail from the Northwind, an icebreaker that attempted to reach the northern portion of the Bering Sea last winter. The ship was unable to pierce the giant ice floes barring one sea lane to Nome. Thin, very hard floes of fast-moving ice choked the Bering Strait passage, and their rapid southward drift overcame any progress that could be made through individual floes.*

GENERAL SCIENCE

Consumer Interest Ignored

Laboratory tests should answer the consumer's question concerning whether or not a product performs as its manufacturer claims, the president of Consumer's Research declares.

➤ The INTERESTS of the consumer-taxpayers have been lost sight of in the present controversy over battery additives, F. J. Schlink, president and technical director of Consumer's Research, Inc., Washington, N. J., charged in a release of testimony that he did not have the opportunity to present to the Senate Small Business Committee on account of suspension of the hearings.

Mr. Schlink declared that laboratory tests, unless they determine the usefulness of a product in service, are of little value to the consumer who wants to know: Does this product perform as the manufacturer claims it does in his sales literature and advertising?

Discussing the controversial tests on AD-X2, Mr. Schlink said that the MIT report indicated that the product has some effect on the battery under the abnormal set-up in the MIT laboratory, but the important question in which the consumer would be interested, namely, does the product give his automobile battery longer life as claimed or restore it to normal functioning, was not revealed or discussed. The Bureau of Standards' tests, Mr. Schlink said, set up laboratory conditions that reflect the action of the product on a battery under load, as when operating the starter of a car.

Support of the National Bureau of Standards was urged by Mr. Schlink as one of the consumer protective agencies of the government. The Bureau of Standards, he declared, has high standing as an impartial testing agency whose findings would be accepted without question by the courts, the division of mail fraud investigation of the Post Office Department, the Federal Trade Commission, the Food and Drug Administration, and Better Business Bureaus throughout the country in cases of misleading claims and advertising that come under the scrutiny of various governmental bodies.

Scientists generally give no weight to testimonials as evidence of the value of a product, Mr. Schlink explained. They correctly hold that the opinion of an unskilled person or one not professionally qualified has no value in judging the performance or lack of performance of a product. In cases at law, testimony by laymen about scientific and technical matters has no standing.

Science News Letter, July 18, 1953

NUTRITION

Stale Bread as Easy To Digest as Fresh

➤ PEOPLE MAY like fresh bread better, but stale bread is just as easy to digest. Laboratory tests showing this and confirming some German studies on humans are reported by Drs. S. S. Jackel, A. S. Schultz and W. E. Schaeder of Fleischmann Laboratories, Standard Brands, Inc., New York, in *Science* (July 3).

The tests were made because these scientists had previously found that putting a small amount of special enzyme, bacterial alpha-amylase, into bread formulas greatly reduced the rate of staling. In the course of these studies the scientists at first thought they had evidence that stale bread was less digestible than fresh. The difference was reconciled when it was realized that it was a question of how well the bread sample was pulled apart to let digestive enzymes get at all parts of it.

Science News Letter, July 18, 1953

ENGINEERING

Trees and Shrubs Affect Comfort Inside the House

➤ THE WAY your yard is landscaped with trees, shrubs and hedges determines to some extent how cool you will be in your house during the sultry summer.

Research at College Station, Tex., on a model house equipped with a yardful of movable model trees, bushes and hedges showed that wind patterns are disturbed by the greenery. This, in turn, can affect the way delightful breezes circulate through the house.

Other factors affecting inside comfort are the way the house is oriented and the window patterns, the Texas A. and M. Engineering Experiment Station reports.

Science News Letter, July 18, 1953

CYTOLOGY

Virus Disease Attack Penetrates Within Cell

➤ A METHOD of attack upon virus disease, which uses subversive chemical methods of penetrating within cells, is being attempted by Dr. R. E. F. Matthews of Britain's Agricultural Research Council at Molteno Institute, Cambridge.

The procedure is to incorporate into the nucleic acid of the virus a chemical so similar to a normal part of the virus that it will effect a replacement, but so different that it makes a virus particle containing it incapable of further multiplication.

Experiments are upon tobacco mosaic virus, which is the standard "guinea pig" among viruses. The research, reported in *Nature* (June 13), is one of the attempts to discover facts that may be helpful in understanding and perhaps combating various virus diseases, even those affecting man.

Science News Letter, July 18, 1953

BOTANY

Tobacco Leaf Beats Mass Production Rate

➤ NATURE HAS produced an assembly line that turns out products faster and in greater abundance than Detroit ever dreamed of.

A single cell of a growing tobacco leaf in a week's time produces some 2,000,000,000 nucleoproteins, enabling a one-inch leaf to grow to seven inches.

Dr. Sam Wildman, Dr. A. T. Jagendorf and C. C. Chow of the department of botany at the University of California at Los Angeles are investigating this phenomenon.

Most protein production studies have been concerned with animal tissue. Animal cell protein production is complicated by the process of cell division. The relatively unexplored process by which the plant leaf manufactures its proteins within non-dividing cells may reveal new information in regard to protein synthesis.

Preliminary studies indicate one of two processes may be involved in the mass production methods of the plant cell: 1. the cell nucleus may stamp out the proteins like a die press, or 2. each nucleoprotein may be a self-reproducing, rapidly multiplying unit like a virus.

Science News Letter, July 18, 1953

PUBLIC SAFETY

Safety Rules for Swimming in Summer

➤ HERE ARE some simple rules for water safety:

1. Select a safe place for bathing, preferably one supervised by qualified life savers. Find out whether the water is free from pollution and is safe from fast currents, and other possible dangers.

2. Never swim alone. It is more fun and much safer to swim with a buddy. And you should always have someone along who could help in an emergency.

3. Don't be a show off and try to demonstrate abilities you don't possess. Know your limitations.

4. If you must test your endurance on a long distance swim, have someone accompany you in a boat.

5. Make sure the water is deep enough and free of sharp rocks or other obstruction before you dive.

6. Enter the water gradually, especially if it is cold.

7. Don't go into the water when you are overheated or overtired, and get out when you begin to feel tired.

8. Wait at least an hour after eating a meal before entering the water.

9. Remember that horseplay can end in tragedy, especially if the other fellow can't swim.

10. If you get into trouble, keep your head. Don't get panicky and reach for the sky. Spread yourself out over the water and keep your arms beneath the surface to help keep afloat.

11. Take your sun gradually. A few minutes exposure the first day is enough. And don't forget that you can get a severe burn even on a hazy day.

These rules were given by Pat Murphy, assistant director of Safety Services, American National Red Cross, speaking as guest of Watson Davis, director of SCIENCE SERVICE, over the CBS Radio network.

Science News Letter, July 18, 1953

AGRICULTURE

Improve U. S. Crops By Exploring Caribbean

➤ MAJOR IMPROVEMENTS for United States crops are expected from plant exploration in the West Indies by Dr. Julian Miller of Louisiana State University and Dr. Donovan S. Correll, U.S. Bureau of Plant Exploration and Introduction.

Some 700 collections were made of Caribbean varieties of plants like cotton, tobacco, corn and sweet potatoes. Many of these tropical varieties will produce higher yields in more northern areas than they do in their place of origin, Dr. Miller said.

Dr. Miller's main interest on the West Indian islands was the collection of sweet potato varieties for experimental planting in the southern states. He gathered 300 different kinds of sweet potatoes on this trip.

Besides the plants, Dr. Miller collected about 20,000 seeds of cultivated and wild sweet potatoes from the islands. These will be used in breeding experiments to develop disease resistant and better yielding new varieties for the United States.

Dr. Miller believes that the West Indies are the original home of the sweet potato. From earlier explorations, the first wilt-resistant sweet potato varieties and the best yellow flesh varieties were brought to the United States from the Caribbean island.

Science News Letter, July 18, 1953

ZOOLOGY

Rare Swamp Monkeys In San Diego Zoo

See Front Cover

➤ A PAIR of extremely rare Belgian Congo swamp monkeys, *Allenopithecus nigroviridis,* have been received by the San Diego Zoo.

The newcomers, shown on the cover of this week's SCIENCE NEWS LETTER, are remarkable both for appearance and habits. They have attractive green and black coats, large eyes close together that stare straight ahead, pointed ears and mutton-chop whiskers. They can jump as high as three feet straight up without warning or apparent preparation.

The swamp monkeys use their big hind feet for swimming. They relish shrimp, small fish and snails as well as ordinary fare such as leaves and berries.

Science News Letter, July 18, 1953

IN SCIEN

BIOCHEMISTRY

New Drug Helps in Tuberculosis Treatment

➤ A NEW drug promises to prove a helpful companion to streptomycin in the treatment of tuberculosis. It is HES, hydroxyethyl sulfone, originally synthesized at the National Institutes of Health and tested there on animals.

A group of physicians at the Howard University Medical School, Washington, have shown that the combination of the two drugs when used on a group of 57 patients produced better results than usual treatments on equivalent groups. Similar groups of patients were given streptomycin alone and streptomycin and sodium PAS, another drug which is used along with the antibiotic.

The new drug seems to be effective against streptomycin-resistant infections. Its use in combination with other antimicrobials when such resistance is encountered is planned.

The Howard University team that reported to the American Trudeau Society consisted of Drs. Howard M. Payne, Robert L. Hackney, Charles M. Domon, Edward E. Marshall, K. Albert Harden and Otis D. Turner.

Science News Letter, July 18, 1953

MARINE BIOLOGY

Octopuses Outwitted By Cunning Crabs

➤ OCTOPUSES ARE perplexed creatures on Britain's Jersey beaches, since a favorite bill of fare, the juicy spider crab, *Maia squinado,* has learned to outsmart them.

When the great tides rush out, thousands of the crabs are left trapped in the pools that dot the two miles of intertidal beach. In the old days, the octopuses used to mop up in these pools.

Now, however, the hard-shelled, long-legged crabs have developed a defense, reports H. J. Baal of the Societe Jersiaise Museum in Jersey. During last September, Mr. Baal observed that the spiny crabs grouped themselves into tight balls about two feet high and three feet in diameter. Their legs were entwined so it became a major task to separate an individual from the heap.

When the octopuses tried to make a meal from this armored mass, the best they could do was to capture a few of the crabs from the outer surface. The heaps remained intact for several days, Mr. Baal wrote in *Nature* (May 29), then the crabs disappeared to their winter quarters with the coming of October.

Science News Letter, July 18, 1953

E FIELDS

ORNITHOLOGY

Hawks and Sparrows Share the Same Nest

➤ HAWKS ALWAYS have liked sparrows —at dinner time. But now, a pair of red-tailed hawks and an English sparrow couple have taken up housekeeping in the same nest.

Ornithologist G. Victor Morejohn had his binoculars trained on a great nest near Davis, Calif., containing four downy red-tails, when he heard the familiar chirping of young English sparrows. He soon spotted a sparrow nest impudently built among the large sticks of the hawk nest and within one foot of the young hawks.

Later, moving pictures were taken of the adult sparrows only inches away from the young hawks. Mr. Morejohn reports in *Condor* (May) that he saw the young hawks leave the nest successfully.

Nobody, however, reported seeing the young sparrows leave.

Science News Letter, July 18, 1953

PARASITOLOGY

Parasites Do Without Mouth, Digestive Tract

➤ THE PARASITES par excellence, spiny-headed worms or *Acanthocephala,* are so well adapted to the life of relying on other animals for food and protection that they have lost most of the organs generally "necessary" for life.

The spiny-headed worm has no appendages, no specialized sense organs, no digestive organs. It has no mouth or alimentary canal, its food being absorbed through its general body wall from the digested material in the host's intestines.

Attaching itself by means of a many-hooked proboscis to the intestinal wall of its host, a vertebrate animal, the adult acanthocephalan becomes little more than a reproductive sac. Reproduction is sexual, by means of union of male and female worms.

At no time in its life history is the spiny-headed worm not parasitic. Even the microscopic larvae live in higher animals. A species that parasitizes swine, and sometimes infects man, passes its larval stage in the grubs of beetles. Swine feeding on these beetles thus infect themselves with the larvae, which then become adults in the hosts' intestines.

While the spiny-headed worms can cause considerable local damage to the intestinal wall of domestic animals and, especially, fish, they are generally considered to be more pest than menace. Human infections are rare.

A post-humous work of Prof. Harley J. Van Cleave, a world authority on spiny-headed worms, has just been published by the University of Illinois Press. Entitled "Acanthocephala of North American Mammals," the volume brings together Prof. Van Cleave's 40 years of study on spiny-headed worms of mammals in America.

His death cut short plans for further books which were to deal especially with the acanthocephalans of birds and fishes. The greatest number of spiny-headed worm species are parasites of fishes.

Science News Letter, July 18, 1953

ZOOLOGY

Insect "Missing Link" Protected in Panama

➤ THE "MISSING LINK" of the world of animals without backbones is a privileged, protected character on Barro Colorado Island, tropical research center of the Smithsonian Institution in the Panama Canal Zone.

This tiny creature, called the peripatus, is neither worm nor insect, though it shows characteristics of both. For this reason it is closely studied by scientists trying to piece together the fragmentary story of the evolution of the invertebrates—animals without backbones.

The peripatus, looking something like a caterpillar, has an internal structure much like the higher worms. It is superficially segmented, with paired excretory organs running serially through the body like worms. The nervous system, too, is somewhat segmented, roughly copying the worms.

On the insect side, the peripatus has paired legs—not six functional pairs like the insects, but many pairs, varying in number according to the species. Like insects, and the whole group to which the insects belong—the arthropods, the peripatus has one or two pairs of legs modified into jaws.

The respiratory system of peripatus is made up of fine tubes, or tracheae, running through the body from openings, or spiracles, along the body wall. This type of system is found only among the arthropods. Its blood, or circulatory, system is similar to the insects, too.

The peripatus is protected on Barro Colorado, although capture of a few individuals is permitted for research. It stays in damp earth under rotting logs during the day, coming out only at night.

It is found in Africa, southern Asia, Australia, New Zealand, South and Central America and the West Indies, except Cuba, some 50 species being known to science. In earlier geological eras, it was probably distributed over much of the earth, but became more and more isolated with changing environments.

Fossils of peripatus have been discovered in rocks that have been found to be as much as half a billion years old. They may have been among the first animals to invade dry land.

Science News Letter, July 18, 1953

ENGINEERING

Can't Hear Police Siren Until Pursuer Is Close

➤ IF YOU are speeding along a highway at 65 miles an hour, chances are that you cannot hear the siren of the pursuing motorcycle policeman until he comes even with your rear bumper.

This is fact, not fantasy. It was among the findings reported to the Highway Research Board in Washington by the Oakland, Calif., police department. It is scientific confirmation of what motorists have known all along.

Seeking to separate the truth of motorists' excuses from fiction, Oakland police ran a check on the "hearability" of various sirens. A "violator" drove a 1949 police car at 65 miles an hour with the driver's window rolled down. Other windows were closed. A motorcycle siren was inaudible until it practically had come alongside the driver's ear.

When the "violator" was cruising at 55, he could hear the siren's wail 40 feet behind him. At a speed of 40, the "violator" could hear the siren 65 feet behind him.

Oakland police also pointed out that the tests were made under ideal conditions as far as the "violator" was concerned. His radio was not blaring dance music or a quiz program, nor was his mother-in-law distracting him with dire predictions. And, of course, the "violator" knew a cop was chasing him with a wide-open siren. He was listening for it.

"Model 17-B electronic sirens" seem to throw their howls more easily into the motorist's ear. Test data show the "violator" could hear the sirens farther behind him. The bigger the siren's loudspeaker was, the better the device could make itself heard. But the faster the "violator" was moving, the nearer the cop had to be before the motorist could hear the siren.

Science News Letter, July 18, 1953

INVENTION

Patent Cigarette With Built-in Match

➤ THE CIGARETTE of tomorrow may come complete with a built-in match. When rubbed against an abrasive surface, a "fire capsule" in one end of the cigarette bursts into flame.

The invention is designed to provide smokers with a cigarette that can be lighted easily, even in foul or windy weather. Upon being struck, the fire capsule forces the small blaze into the tobacco.

The capsule consists of inflammable chemicals overlying a tiny charge of explosive. It is the explosive that drives the flame into the cigarette, reports Frank Witt of San Francisco. The explosive charge is small enough to be harmless, and should not frighten smokers when it goes off. The patent is No. 2,644,461.

Science News Letter, July 18, 1953

MEDICINE

Living Cell Is Probed

New techniques and new instruments take scientists deeper into the interior of the cell, the basic structural unit of our bodies, to learn more about life's secrets and about cancer.

By WADSWORTH LIKELY

➤ SCIENTISTS ARE probing deeper and deeper into the cell, the basic structural unit of our bodies, to find out how we grow and how our cancers grow.

Powerful new microscopes and delicate new techniques are bringing the scientists closer to the secret of life itself. Before they get there, however, they may find a way to control abnormal growth, which is all that cancer is.

Each one of us develops from a single cell at the beginning. This cell divides and then those two divide, and this process continues. At some point cells begin to be different. Some become the basis of our muscles, others of our bone. Finally a complete human, with all its different parts and different functions, is formed.

These two things, cell division and cell differentiation, may hold the key to why normal cells sometimes change into cancer cells, and then divide and divide until millions of them overwhelm the body and kill it.

In Berkeley, Dr. Daniel Mazia of the University of California and Prof. Katsuma Dan of the Tokyo Metropolitan University have succeeded in isolating the spindle-shaped structure involved in cell division in pure form. And they have isolated the substance, a protein, of which it is composed.

Isolate Mitotic Apparatus

Cell division is called "mitosis," and this structure which has been isolated is called the mitotic apparatus. For 75 years scientists have been studying cell division under the microscope, and for almost that long they have been trying to isolate the mitotic apparatus. Previously the chemicals used to fix the cells had always destroyed the extremely delicate apparatus.

Detergents were the answer. Drs. Mazia and Dan, with a regular commercial detergent, succeeded in dissolving the membrane surrounding the dividing cell and the stuff inside.

They were able to discover that the mitotic apparatus is a protein of low molecular weight and makes up only about one percent of all the protein in the cell.

For their investigations, the two scientists used the eggs of sea urchins. Sea urchin eggs can be made to divide every hour when kept at constant temperatures. Young eggs undergoing their first rapid cell divisions are particularly useful because this rapid division, which slows down as the organism becomes older, is thought by many to be something like the rapid cell division which is characteristic of cancer.

Three-D on the television screen is entering the fight for cancer and the study of cells. An X-ray scanning microscope which throws a picture on a TV screen has been developed by a young graduate student, Howard Pattee, at Stanford University in Palo Alto, Calif. Also several new X-ray microscopes that utilize reflections of X-ray beams from gold mirrors to make a greatly enlarged photograph have been built at Stanford. While these do not enlarge quite as much as the electron microscope, they will permit scientists to see living things. The electron microscope, most powerful of all, permits seeing objects only in a vacuum; therefore, they must be dead.

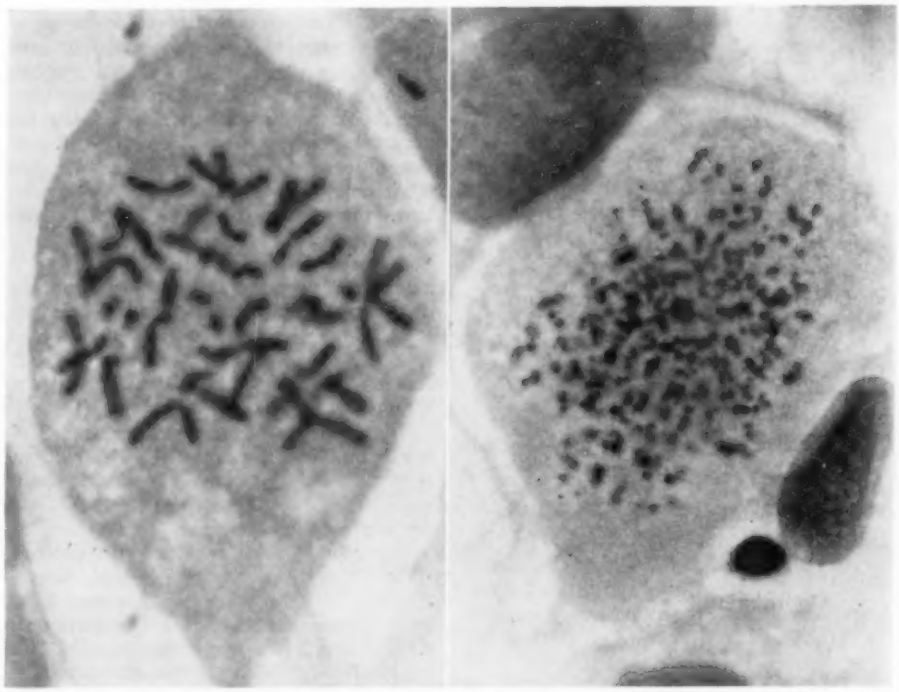
In the TV type, X-rays are produced by an electron beam passing through a tungsten plate. The objects to be studied are placed on the other side of this plate. The rays will penetrate an object with varying intensity, depending on its composition, and then will be picked up by an electronic radiation detection device. This permits the picture they produce to be projected on the screen of an ordinary TV tube. Now plans are underway to add a third dimension to such a picture.

The big problem with the other X-ray microscope is that it is impossible practically to focus the X-rays with lenses. An ordinary lens, as in a pair of spectacles, focuses X-rays at a distance of about 60 miles.

Focus With Mirrors

But what could not be done with a lens could, it turned out, be done with mirrors. Dr. Paul H. Kirkpatrick, physics professor at Stanford, found he could utilize the reflection characteristics of X-rays by bouncing them obliquely off a series of concave gold mirrors. Thus the X-rays could be bent and focused at practical distances.

The rays first pass through the object to be photographed. Then, changed by the characteristics of the object, they are bounced off as many as four of the gold mirrors before they are allowed to strike the photographic plate. This plate, about the



BEARERS OF HEREDITY—At left is a picture of a cell taken from a human spleen. At right is a human cancer cell. The black rods in the first cell are chromosomes, important in the heredity process. All the little black dots in the cancerous cell are either chromosomes or chromosome fragments. A new process now enables scientists to count the number of chromosomes with ease.

size of a thumbnail, can then be enlarged to convenient size.

Spreading out living cells the way a fried egg spreads out on the pan has shown new facts about the chromosomes in the cells and their relation to cancer. Chromosomes are important in the heredity process.

The spreading-out made it very easy to count the chromosomes. It was discovered that cancer cells had sometimes as many as a thousand chromosomes or chromosome fragments. Normal cells in humans have only about 48.

Spreading out the cells was the result of an accident in the laboratory of Dr. C. M. Pomerat, University of Texas Medical School cytologist. There they grow living cells in single layers in test tubes.

Periodically, the cells are washed in a solution with a salt concentration of 0.8%, the same as the salt concentration of human body fluids. One day, Dr. T. C. Hsu bathed the cells in a solution with only .08% salt. Immediately the cells spread out. In an effort to take in their normal amounts of salt, they took in great quantities of the solution.

Drs. Pomerat and Hsu seized upon the accident and launched a program of counting chromosomes. First they found that human cells frequently have a few more or a few less than the normal complement of 48 chromosomes. Then they examined cells from three kinds of human cancer. A very malignant cancer of the connective tissues showed cells with as high as 80 chromosomes in them.

Less malignant cancers also had more than the normal complement of chromosomes but to a more modified degree.

Thus the happy accident and the detailed planning, the salt solution and the TV screen bring us more of life's secrets and take us further toward the solution to the problem of cancer.

Science News Letter, July 18, 1953

PHYSIOLOGY

Heart Beats, Then Rests

➤ HEARTS WORK eight hours out of every 24. But theirs is not an eight-hour day. They work short shifts with short rest periods right through the 24 hours.

This explains how the heart can continue beating every second or oftener, hour after hour, week after week and year after year over a long life span. The rest period, called the diastole, for the heart muscle between beats usually exceeds the actual duration of the process of contraction, called the systole.

"Thus at a heart rate of 60 per minute, the heart is active for one-third of each second and rests two-thirds of each second, which makes a workday of eight hours out of the 24. At faster rates the periods of work and rest both shorten but the latter more than the former."

This explanation of the heart's workday is given by Dr. Paul D. White, famed heart specialist of Boston, in a report in the *American Scholar* (Summer). Other facts about the heart rate given by Dr. White follow:

"There is a familiar dictum (saying) that the heart rate, and therefore the pulse rate, of the normal human adult at rest should be 72 beats per minute. This is so fixed in the minds of many persons that they are unduly worried if they find on some occasion or other that their pulse rates are in the 40's or 50's, or in the 80's or 90's.

"For their reassurance, I state at once that I have myself found that at physical rest a person in excellent condition may have a pulse rate as low as 38 beats per minute, and another person equally fit may have a rate of 118 (under some excitement, however); this is a difference of 80 beats a minute."

"A newborn baby has at rest a heart rate of 120 or a bit more, and this rate drops in the first few years of life more than in later years. Not only is there a considerable range in pulse rate between different individuals, but also it is true that any one person normally shows, in the course of a single day, a wide range of heart rate: when one first awakens in the morning, the heart may beat only 45 or 50 times a minute, but by midafternoon on a busy day the rate may have increased to 80 or 90.

"The blood pressure levels may vary normally also, though not to the same degree. A slow or a fast heart rate sometimes runs in certain families."

Science News Letter, July 18, 1953

BOTANY

Chlorophyll Releases Water From Leaves

➤ CHLOROPHYLL, THE green substance in plants, does more than promote the capturing of energy from the sunlight in the manufacture of food out of carbon dioxide and water. It promotes the release of water vapor from the leaves.

For nearly 60 years this notion of chlorovaporization, as it was named, has been in dispute because the amount of water given off is so small that it is difficult to demonstrate experimentally. Now a French scientist, Dr. Joseph Sivadjian of the Institut Pasteur, Paris, has worked out a very sensitive and simple means of demonstrating the phenomenon by a photographic process.

Mercury and silver iodide gelatin photographic films or plates are used. Normally yellow, they blacken when exposed to light. Moisture instantly discolors the emulsion blackened by exposure. Leaves put in contact with such plates form images that show that chlorophyll aids water vapor release.

Science News Letter, July 18, 1953

NUTRITION

Bread Has Fresh Feeling With Two Soy Products

➤ BREAD CAN have that fresh feel the housewife tests for by squeezing the loaf if either of two soy products is baked into the bread, Dr. C. W. Ofelt, A. K. Smith and P. A. Belter of the U.S. Department of Agriculture declared at the meeting of the Institute of Food Technologists in Boston.

The two soy products are "Gelsoy" and soybean whey products.

The fresh quality is called "crumb softness" in the baking industry. Two classes of chemicals, monoglycerides and polyoxyethylene monostearate, give this crumb softness. Polyoxyethylene monostearate, however, is prohibited by the federal bread standards from being put into bread shipped in interstate commerce.

Because the soy products are food products rather than chemicals, many people may consider them more desirable additives to bread. Low cost and the facts that the bread is easy to handle in the dough stage and springs back after handling, instead of getting deformed, are further advantages.

Production of the new softeners has not yet gone beyond the pilot plant stage.

Science News Letter, July 18, 1953

TECHNOLOGY

Microwaves Control Company Operations

➤ MICROWAVE RADIO has been licensed for the first time to help a company control several far-flung operations from one office.

Based on the same principle as the microwave systems that relay TV programs from coast to coast, the radio network links Freeport Sulphur Company's production headquarters in New Orleans with its shipping point, a sulfur mine, a "floating" plant and a plant under construction.

The electronic system is particularly valuable because the company's mines are in marshy land too soft to support telephone poles. The area also is lashed periodically by hurricanes and high winds.

Science News Letter, July 18, 1953

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ENTOMOLOGY

Wasp Poisons Caterpillar To Insure Food for Young

➤ RUTHLESS CHEMICAL warfare, using a poison so virulent that one part of it to 200,000,000 parts of the enemy's blood causes permanent living-death, is a daily part of the struggle for survival in the insect world.

To discover how these poisons work, Dr. Raimon L. Beard, entomologist at the Connecticut Agricultural Experiment Station in New Haven has studied the venom of a tiny wasp, *Habrobracon juglandis,* and how it affects the wasp's prey of helpless, fat caterpillars.

The female *Habrobracon* injects venom into its host, causing complete paralysis, and feeds at leisure on the blood that oozes from the wound. Then the female lays her eggs on or near the paralyzed caterpillar, so her young will have abundant food when they hatch.

The entomologist reported in the Experiment Station bulletin that the wasp discharges about 0.000000065 milliliters of venom at one time. (A milliliter is slightly more than 1/1000 of a quart.) Yet this almost infinitesimally small amount of poison is more than enough for the job.

By weighing the experimental caterpillar, *Galleria,* and calculating its blood volume, Dr. Beard estimated that the presence of one part of venom in 200,000,000 parts of the caterpillar's blood is plenty to cause complete paralysis.

Paralysis in the caterpillar results from impairment of the excitatory processes of the body wall muscles, Dr. Beard said, and so the venom probably works on the connections between the muscles and nerves.

Galleria caterpillars undergoing violent tremors after exposure to DDT are readily quieted with *Habrobracon* venom, Dr. Beard said.

Science News Letter, July 18, 1953

INVENTION

Patent Given to Mustard Gas Deactivator

➤ THE GOVERNMENT has officially revealed that it has ways of neutralizing deadly mustard gas. Patented by Harold P. Averill, Aberdeen, Md., and Robert Pfanstiel, Cleveland Heights, Ohio, the mustard gas neutralizer is a mixture of kerosene and sodium bicarbonate, carried in an emulsifier. The emulsifier can be made of horse oil mixed in various proportions with water and with magnesium carbonate, magnesium hydroxide or magnesium oxide.

Contaminated areas are treated with the neutralizer. The solution immediately breaks down the mustard gas into harmless components. Soon soldiers can pass through the area without fear of being blistered by the vicious vesicant. The patent, No. 2,644,796, is assigned to the government.

Science News Letter, July 18, 1953

• Books of the Week •

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

THE BUREAU OF HUMAN NUTRITION AND HOME ECONOMICS: What It Is . . . What It Does — Agricultural Research Administration — *U.S. Dept. of Agriculture,* rev. ed., 24 p., illus., paper, free upon request direct to publisher, Washington 25, D. C. Answers questions about the Bureau and describes present research.

THE CHILD WITH A CLEFT PALATE — Children's Bureau, Social Security Administration — *Govt. Printing Office,* 13 p., illus., paper, 10 cents. Outlines different ways of treating cleft palate, underlines the importance of early speech training and tells where parents can go for help in their own communities.

CIVIL AIR REGULATIONS AND REFERENCE GUIDE FOR PILOTS — Associated Aeronautical Staff — *Aero Publishers,* 1953 ed., 144 p., illus., paper, $1.75. Contains all of the CAA regulations and requirements for pilot certificates.

FIFTY YEARS OF FLIGHT: A Chronicle of the Aviation Industry in America, 1903-1953—Welman A. Shrader—*Eaton Manufacturing Co.,* 178 p., illus., $5.00. A chronological history of American aviation, recording the dates and highlights of the major achievements and outstanding events in aeronautics.

GENERAL BIOCHEMISTRY—William H. Peterson and Frank M. Strong—*Prentice-Hall,* 469 p., illus., $6.50. Considers the chemical activities of animals, plants and micro-organisms.

HOME SHELTERS FOR FAMILY PROTECTION IN AN ATOMIC ATTACK—Federal Civil Defense Administration—*Govt. Printing Office,* TM 5-5, 86 p., illus., paper, 30 cents. Helps the householder select the type of shelter best suited to his needs, and gives him step-by-step building instructions.

A LABORATORY MANUAL OF EXPERIMENTS IN PHYSICS — Leonard Rose Ingersoll, Miles Jay Martin and Theodore Alton Rouse—*McGraw-Hill,* 6th ed., 286 p., illus., $4.00. Containing 77 experiments in introductory physics, this differs from previous editions by the omission of 13 outmoded experiments and the inclusion of 7 new ones.

THE METAMORPHOSIS OF A FLY'S HEAD—R. E. Snodgrass—*Smithsonian Institution,* Pub. 4133, 25 p., illus., paper, 30 cents. Reviews the scientific knowledge related to fly metamorphosis, or change from larva to adult. (See SNL, July 11, p. 29.)

MOST-OFTEN-NEEDED SERVICING INFORMATION 1953 UHF CONVERTERS & TUNERS—M. N. Beitman—*Supreme Publications,* 95 p., illus., paper, $1.50. This manual of factory data explains the methods used by various manufacturers to produce good reception of UHF stations and tells the mechanic how to test and service these units.

REVIEW OF CURRENT RESEARCH AND DIRECTORY OF MEMBER INSTITUTIONS, 1953 — V. E. Neilly, Ed. — *Engineering College Research Council,* 330 p., paper, $2.50. Gives a picture of approximately 7,500 research projects being carried on in engineering at 103 member colleges.

SELECTED SCIENCE TEACHING IDEAS OF 1952—R. Will Burnett, Ed.—*Natl. Science Teachers Assoc.,* 57 p., illus., paper, $1.50. A selection of reports from 57 teachers on their own best practices and most effective techniques for improving the quality of the science instruction. Emphasis is on project-type work.

Science News Letter, July 18, 1953

INVENTION

Mustard Gas on Water

➤ A VICIOUS mixture of mustard gas and oils that can be floated on water as a defense against invaders has just been patented after lying in secret Patent Office files for 28 years.

It clings to ships and blisters men and animals moving through the water days afterward.

Invented by James Edward Mills of Edgewood, Md., the patent, No. 2,643,966, was assigned to the Army. It had been kept secret by repeated requests of the Secretary of War acting under the authority of the patent laws.

Informed sources said a similar weapon had been described in 1937 by a German author. Army officials conceded the invention was no longer secret and permitted the patent to go through.

Although the Army Chemical Corps would not comment on the invention, the Department of Defense reported that the United States never has used poison gas and does not intend to use it except "in a retaliatory way." This means the enemy must use it first. The Geneva conference outlawed the use of poison gas in warfare.

The patent describes a mixture of mustard gas and oils that can be poured in harbors, rivers and streams. When mixed with castor oil, the mustard gas spreads evenly over the water and remains potent for several days.

Six tons of mustard gas used as a ten percent solution in castor oil can be dumped by airplane into water. The vesicant will spread out over a square mile.

Although castor oil is described as being "ideal," other oils can be used to float the mustard gas. Mineral oils work satisfactorily where the air and water are warm. Animal oils help keep the mustard gas from being decomposed by the water. "Certain vegetable oils" also can be used.

Science News Letter, July 18, 1953

MEDICINE

Women Nicotine Sensitive

Age as well as sex seems to make a difference in the responses to effects of cigarette smoking, tests made with radioactive iodine in blood albumin show.

➤ WOMEN ARE "much more sensitive" to nicotine and other tobacco products than men. Cigarette smoking tests showing this are reported by Dr. Morris Friedell of the Hektoen Institute for Medical Research, Cook County Hospital, Chicago, to the *Journal of the American Medical Association* (July 4).

In his tests of 100 men and women, Dr. Friedell found that 79 were sensitive as shown by changes in blood circulation to ordinary cigarette smoke. This means, he points out, that one out of five who smoke show no response to a single cigarette, at least by his method of testing.

When the newly developed, highly efficient, filtered cigarettes were tried, 34 persons, or one out of three, showed no response to the smoke from the filtered cigarettes.

Women responded somewhat better than men to these special filter cigarettes.

"The principle of filtration of tobacco smoke is probably a good one and should be used by both men and women," he advises. "Women evidently need it more than men."

Age as well as sex seems to make a difference in response to effects of cigarette smoking. Many of those over 35 in the group did not show change. Dr. Friedell thinks this is either because they do not inhale, or because the blood vessels near the surface of the body are less sensitive in the older persons. Those over 40, he believes, can smoke without immediate changes in circulation near the body surface and in fingers and toes.

The tests were made with radioactive iodine in blood albumin. This is injected into a vein and five to 10 minutes later is well mixed with the blood in the general circulation. Changes in circulation then can be told from measuring with a scintillation counter the changes in radioactivity in the fingers.

The group tested consisted of 52 men aged 21 to 70, and 48 women aged 17 to 61. All had presumably normal circulation. During the test each smoked for four minutes at a rate that consumed two-thirds of one cigarette in that period. Cigarettes of standard size in popular brands selected at random as well as the special filter type cigarettes were used.

The greater sensitivity of women, Dr. Friedell believes, is due to their having a more unstable, elastic blood vessel system. It probably accounts for two factors:

"1. Women who enjoy the reaction of tobacco become deeply habituated, continue to smoke and find it hard to break the habit; 2. Men who get less reaction from smoking probably will smoke more cigarettes."

Science News Letter, July 18, 1953

MEDICINE

Filter Tips Remove Little of the Nicotine

➤ FILTER TIPS on cigarettes remove very little of the total nicotine in the smoked portion of the cigarette, the American Medical Association reports.

The report is based on tests carried out in the association's chemical laboratory at the request of its advertising committee. These tests were done by Robert R. Stark of the laboratory staff under its director, Dr. Walter Wolman.

Of six filter tips tested, the most efficient seemed to be one made of asbestos laminated with paper. With this tip only eight percent of the nicotine in tobacco actually smoked is transferred to the mainstream smoke and thus reaches the smoker's mouth. The amount in a regular, all-tobacco cigarette is 21%.

However, the most efficient of the filter tips tested has now been modified. The filter is more loosely packed, apparently in an effort to improve the smoking qualities. As a result, the nicotine transferred to the smoker's mouth has risen to 13%.

The other filter tips tested were made of paper, fiber and cotton. Included in the tests were the three largest selling filter tip cigarettes on the market.

The report concludes by pointing out that calculations can be "contrived" to show low percentages of nicotine in mainstream smoke by using the same test figures but choosing a different base for the calculations.

By basing the calculation on the total weight of the cigarette, for example, the figure 0.25% (one-quarter of one percent) nicotine in the smoke of a regular brand of cigarette can be obtained.

Science News Letter, July 18, 1953

TECHNOLOGY

New Building Envelops Kansas City Rock Mound

➤ AN EIGHT-STORY building, bigger at its top than at its bottom, has been designed to sit on a big rock mound that so far has baffled building constructors.

The rock mound, situated near the downtown business area in Kansas City, Mo., is a natural formation. It is so extensive, however, that no attempt has been made to put a building on it.

The building, new general headquarters of Hallmark Cards, is designed to take full advantage of the natural rock formation. The building will go "over and around" the rock mound to minimize excavation.

The top floor will overlay the entire mound and will have 20 times more area than the ground floor. Architects also are taking advantage of the sloping terrain around the building site. The slope is such that an automobile ramp will be built directly from surrounding streets to all floors in the building. The building's roof will serve as a 400-car parking lot.

In addition, the structure will sport a functional zoo and a greenhouse. Animals and plants will be used by Hallmark's artists in the production of greeting cards.

Science News Letter, July 18, 1953

AERONAUTICS

Waste From Power Plant Makes Jet-Proof Runway

➤ A RUNWAY material that resists the terrific heat of jet engine exhausts has been developed by scientists of the Philadelphia Electric Co.

Tests of the substance, which largely is composed of waste products recovered from the utility's big furnaces, show that it withstands temperatures up to 2,400 degrees Fahrenheit. Present concrete runways made with Portland cement sometimes melt under the severe blast of the jet exhausts.

The material furthermore is not affected by spilled jet engine fuel. Ordinary aviation fuels usually do not harm concrete runways. But slow-evaporating jet fuels seep into the concrete and attack it.

Composed of fly ash, lime and coal slag, a sample of the material was tested for 15 seconds in the 2,000-degree exhaust of a kerosene-oxygen rocket engine. The sample melted only 1/64-inch below its surface. No other detrimental effects were noted. The speed of the exhaust gases reached several thousand feet a second.

The inexpensive material was tested by the Corps of Engineers and the Westinghouse Electric Corporation, reports *American Aviation* (June 22).

Science News Letter, July 18, 1953

LOOK! A MILLION THRILLS!
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INVENTION

Radiographs of Future May Be Done in Color

➤ YOUR NEXT X-ray picture may be made "in glorious color" because inventor Bernard M. Fine of Lynn, Mass., was irked at the failings of black-and-white radiographs.

Mr. Fine points out that ordinary radiographs sometimes are inadequate when the surgeon is searching for slivers of nonmetallic glass or other small particles embedded in the flesh. Frequently a glass particle does not stand out from the rest of the picture so that it can be readily detected.

To get around this, Mr. Fine tried out commercial color films which change the invisible energy of X-rays and "selected alpha, beta and gamma rays" into bright, visible colors when the film is developed. Slivers of glass buried in the flesh may appear a dark tan in comparison to the light-tan color produced by flesh. The color difference makes it easier for the doctor to spot the foreign body. Mr. Fine assigned his patent, No. 2,644,096, to the Radiograph Development Corp., Washington, D. C.

Science News Letter, July 18, 1953

MARINE BIOLOGY

Mussels Threaten Power Plant, But Engineers Win

➤ ENGINEERS HAVE scored a victory against the lowly bay mussel that was threatening the Los Angeles electric power system.

H. T. Duplice, department of water and power engineer, reported to the American Society of Mechanical Engineers meeting in Los Angeles, that mussels were choking tubes used to carry cooling water from the bay into the harbor steam plant.

Worried engineers reasoned that they must find a way to kill the marine life while it was still young. After several unsuccessful experiments, they decided to seal off one of the two circulating water conduits for five to seven days each month.

This was done during the spawning period of the bay mussel. Mussels in the closed-off pipe consumed oxygen from the water, eventually using it all. Then the mussels died. Over 45 tons of dead marine life were washed from the conduit into the discharge basin after the first test.

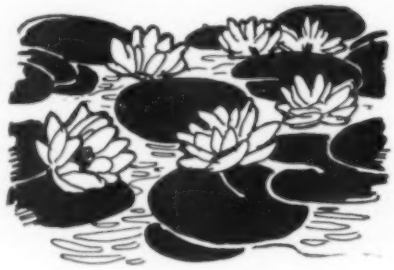
Mussels and other marine life had not been a problem to the steam plant engineers until 1946. Heavy water pollution from nearby petroleum and manufacturing industries dumped strong sulfides into the harbor waters. The chemicals killed most marine life.

In 1946, however, a program was set up to minimize harbor water pollution. As the water became cleaner, bay mussels, a rock boring clam, barnacles, vegetative matter and other marine organisms began moving into the habitable water.

Science News Letter, July 18, 1953

HORTICULTURE

NATURE RAMBLINGS



Flower of the Nymphs

➤ SERENE, COOL, immaculate, the waterlily floats beneath the summer sun, with big, flat drops of water shining on its round, flat leaves.

The waterlily has been the delight of poets of all ages and peoples. Of philosophers, too, who like to reflect how all that superb beauty has been extracted from the black mud of the bottom, where the rootstocks of the plant have their hold.

There are only a few kinds of waterlily in America. The white one is the most familiar, as well as the most beautiful. And it has the advantage over the European white waterlily in that it is very fragrant.

Then we have a smaller yellow species, vulgarly called cow-lily or spatterdock, in the eastern states; but in the Rocky Mountains, where the white one does not grow, a second yellow species reaches a much larger size.

Real home of the waterlilies, however, is in the tropics. There they develop all sizes and colors, including delicate pinks, glowing reds and gorgeous blues. Many of the choicest tropical waterlilies have been introduced into cultivation in the temperate zones; fortunately it is possible to grow them to maturity and get blossoms in a single season.

All you need to do is plant the seed after the water has warmed up sufficiently in the spring. You can even start tropical waterlilies by tossing the seed into a shallow farm pond that isn't too much churned up by wading cattle.

One waterlily species, the Victoria regia of tropical South America, claims the distinction of having the largest of all known leaves. These natural rafts, with their upturned rims, have sufficient power of flotation to carry the weight of at least a child, if a framework of light lath is set down first to prevent the burden from being concentrated in one spot and thus breaking through the leaf tissue. The flowers of this giant-leaved waterlily, however, are relatively small and inconspicuous.

Botanical names sometimes sound harsh to the layman, but there can be no quarrel with the Latin name of the principal waterlily genus. There is some disagreement among botanists on this score, but both of the names that are in use are beautiful.

One school calls it Castalia, which is the name of a fountain where the Muses of Greek mythology used to come. Other botanists, following the lead of the great Linnaeus, call it Nymphaea, which needs no explanation.

Science News Letter, July 18, 1953

NUTRITION

Hot Weather Beverage

➤ IN GRANDMOTHER'S day standard refreshment for hot afternoons or evenings consisted of a pitcher of ice cold lemonade and a plate of homemade cookies. The children set up lemonade stands on the front lawn to make a few pennies.

All this seems to have been replaced, even in the country, by ice cream wagons and bottled carbonated beverages. But chilled fruit and vegetable juices are still appetizing and healthful hot weather beverages.

Milk and buttermilk are still given top rating by many nutritionists as hot weather beverages because they are both nourishing and, when served cold, really refreshing. For variety in flavor, chocolate syrup, molasses or coffee can be stirred into the milk.

Remember that fluid milk should be kept cold and closely covered. This seems like a fact too well known to deserve mention. However, a study by the West Virginia Experiment Station shows that many homemakers need reminding on this point.

During three months, June, July and August, the West Virginia Station compared milk delivered to and kept in homes with electric refrigerators with milk kept in the laboratory. The milk from homes was poorer in flavor and increased faster in acid and bacteria than the milk in the laboratory. The station reports that delayed refrigeration in homes and leaving bottles uncapped or carelessly covered accounts for the poorer flavor of milk.

The station reports that bottled pasteurized milk, properly kept, has good flavor up to three or four days after delivery, but changes rapidly to poor flavor after five to six days. This finding is important both to dairy companies and homemakers because it shows that delivery every other day or three times a week is satisfactory for good pasteurized milk, if both milkman and homemaker use care in keeping it.

Hot tea and hot coffee can cool you by causing perspiration which takes away heat as it evaporates.

Science News Letter, July 18, 1953

METEOROLOGY

Better Humidity Measure

➤ A HIGHLY sensitive, speedy instrument that can measure humidity as it has never been measured before has been developed by the Weather Bureau.

The new instrument will mean more safety for airplanes flying in areas of ice fog, will be useful to food carriers who use refrigeration, will aid wind tunnel experiments with new plane models, and will allow more precise measurements of dangerous turbulence at airports. These are but a few of the industrial and research uses to which this delicate instrument, besides giving weathermen a more accurate picture of relative humidity, can be put.

There are two great advantages to the new instrument—called the optical hygrometer—over past methods of measuring humidity. First, the measurement is instantaneous; there is no time lag as with current methods. Second, the instrument is extremely sensitive in temperatures below freezing; in current methods, the freezing process has interfered with measurement.

The instrument is based on the principle that some infrared light lets water vapor through, while other infrared light absorbs water vapor. The instrument directs alternating beams of infrared light at a piece of air—one beam is not affected by the water vapor in the air, the other is. The difference between the two beams is the measurement of the amount of water vapor in the air.

The instrument only signals changes in the amount of water vapor in the air. Already, the Weather Bureau has found, relative humidity fluctuates a great deal more than was originally thought. Only one instrument is now in action, on top of the Bureau's administration building in Washington, but it has recorded great variations over short periods of time in the amount of water vapor in the air.

This amount is important in carrying out wind tunnel tests of airplane models. Changes in the humidity from minute to minute can be a measurement of the amount of turbulence at airports. The ability of the new instrument to measure low temperature humidity will make possible better predictions of dangerous ice fogs in Alaska and other northern regions where our defense planes have to fly. Humidity is, of course, a big factor in the efficiency of refrigeration systems.

For the Weather Bureau, it will become a basic standard instrument, situated at the larger weather stations in the nation. Two Bureau engineers, L. W. Foskett and Norman Foster, invented and developed the instrument from ideas they had as far back as 1943.

Science News Letter, July 18, 1953

MEDICINE

Mass G. G. Inoculations

➤ ALMOST A thirteenth of the polio-fighting gamma globulin that will be available this year is being used in the Montgomery, Ala., Caldwell County, N. C., and Elmira, N. Y., mass preventive inoculations.

Latest area to receive gamma globulin for children under 10 was centered at Elmira, N. Y., comprising Steuben and Chemung counties. Enough for 35,000 doses, 225,000 cubic centimeters, was sent there for inoculations starting July 11. About 50 polio cases have occurred in this area.

Officials of the U. S. Public Health Service and the National Foundation for Infantile Paralysis are anxiously awaiting developments that may result in a call from other areas for the precious material for emergency use. Likely areas are South Dakota and Utah.

Enough for about 43,000 shots, 300,000 cubic centimeters, has been used in Alabama and North Carolina. The estimated total amount to be available nationally is about 7,000,000 cubic centimeters or a million doses.

Now supplies are being made available constantly from the half dozen companies processing and testing the gamma globulin for antipolio use. Supplies are coming from Red Cross blood and from hospitals where placentas from births are being collected since each contains about a half pint of blood, of which about three and a half c.c is gamma globulin, about half a dose.

In most areas the limited supply of this human blood derivative is distributed to physicians for use only for contacts under 18 years of age or for pregnant woman in households in which there have been cases of polio.

Science News Letter, July 18, 1953

BIOLOGY

Mice Withstanding Zero Cold Aid Defense Tests

➤ MICE THAT live and flourish at zero Fahrenheit temperature will help the armed forces in some of their arctic warfare problems, it is expected by scientists at the Jackson Laboratory, Bar Harbor, Me.

All of the 57 varieties of inbred mouse strains are being tested for those that can withstand extreme temperatures, but it is already known that some of the strains withstand zero cold.

Science News Letter, July 18, 1953

Questions

BIOCHEMISTRY—How will radioactive cortisone be used? p. 38.

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ENGINEERING—At what distance from a speeding car can a police siren be heard? p. 41.

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MEDICINE—How has sensitivity to cigarette smoking been tested? p. 45.

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NUTRITION—What is the advantage of using soy products in bread? p. 43.

• • •

ORNITHOLOGY—When were the Moas exterminated? p. 37.

• • •

PSYCHOLOGY—What talents are needed to learn languages? p. 36.

• • •

ZOOLOGY—What is the "missing link" of the invertebrate world? p. 41.

• • •

Photographs: Cover, Bryant Evans; p. 35, Carnegie Institution of Washington; p. 37, Bell Telephone Laboratories; p. 39, U. S. Coast Guard; p. 42, University of Texas; p. 48, Ben Sackheim, Inc.

ENTOMOLOGY

How to Tell the Ants From Termites

➤ ARE THOSE "flying ants" showing up in your yard this summer really ants, or are they termites?

Here is how to tell:

Look at their wings. Flying ants have two pairs, but the pairs are of unequal length. The longest pair of ant wings is only about one-third its body length. Flying termites have two pairs of wings too, but both are of equal length. The wings average twice the length of the termite's body.

Another clue is that ants have a narrow waist, like wasps. Termites, on the other hand, are about equal thickness throughout the body.

Ants and termites take to the air at mating time. Ants mate during the flight, the males dying shortly afterwards. The fertilized female ant alights, bites off her wings and digs a shallow nest in earth or wood, where she deposits a few eggs to begin her future colony.

Termites do not mate until after the flight. For this reason their aerial adventure is often called a "dispersal flight," in contrast with the ants' "nuptial flight." Both males and females lose their wings spontaneously or knock them off against some hard object. Termites do not bite off their wings as ants do.

Once male and female termites pair off, they build a burrow together and seal themselves off. They do not usually mate until this honeymoon cottage is completed.

Science News Letter, July 18, 1953

• New Machines and Gadgets •

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE NEWS LETTER, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 683. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

⚙ *RUGGED STOOL is designed to help housewives hang pictures, reach shelves and put up curtain rods. It brings a man into better position for washing the top of his car. Made of steel, the stool is 10¼ inches tall, weighs 4.5 pounds, has rubber-tipped legs and a rubber-capped top.*

Science News Letter, July 18, 1953

⚙ *FISHING POLE carrier clamps to the rain gutter of a car and accommodates from three to five rods or poles. The steel device has a protective covering to guard poles, rods and car from scratches.*

Science News Letter, July 18, 1953

⚙ *NOTE-FINDER helps beginning piano students learn their way round the keyboard. The pocket-sized device has a printed facsimile of the piano keyboard, and a sliding panel which allows the user to frame notes in a viewing window. The reverse side of the card reveals the name of the note and the key. An indicator simultaneously points out the key on the miniature keyboard.*

Science News Letter, July 18, 1953

⚙ *ELECTRIC HAND dryer for the home, shown in the photograph, works on the same principles as those now used commercially. Attached to the wall, the 9-x-7-inch device uses household current and blows hot air for a minute before switching off automatically. It also can be set to run longer when hair is to be dried. A tiny ozone-producing bulb inside the unit adds a "clean smell" to the room, the maker reports.*

Science News Letter, July 18, 1953

⚙ *STORAGE BAG for rifles is chemically treated to release a dry vapor that adheres to metal parts, protecting them from atmospheric humidity and corrosion, the manufacturer reports. Embodying the same principles used by the armed forces during World War II, the bag eliminates the need for greasing or disassembling the rifle for storage.*

Science News Letter, July 18, 1953

⚙ *"ENDLESS" HACKSAW features a special construction that permits the user to saw through any amount of metal without being restricted by the usual hacksaw frame. The saw is said to be extremely useful when automobile wrecks or airplane crashes make it necessary to cut away large metal panels to free persons trapped in the wreckage.*

Science News Letter, July 18, 1953

⚙ *CHESS AND CHECKER set comes in a small walnut-colored plastic case with a hinged lid which, when closed, keeps "men" in position on the playing field inside the case. Suitable for taking with you on trips or as a gift for servicemen, the set's chessmen and checkers are molded of red and ivory plastic.*

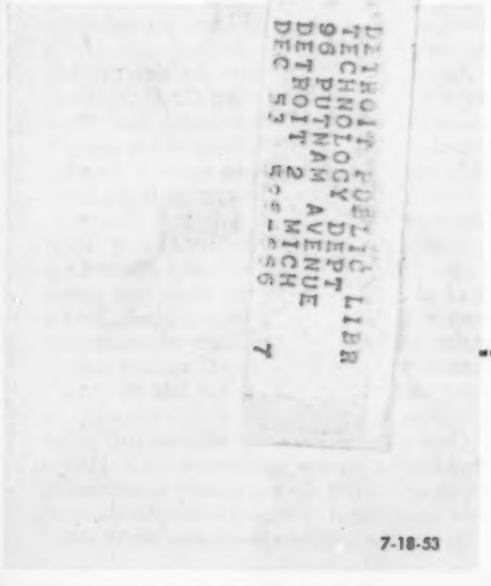
Science News Letter, July 18, 1953

⚙ *STAMP PAD ink now lets you use office-type rubber stamps successfully on most plastics. The new ink is said to dry quickly and to adhere without chipping or rubbing off. It also works well on paper and lacquer-coated objects, the maker reports.*

Science News Letter, July 18, 1953

THE CHEMISTRY WE USE

a compilation of "Home Lab" experiments, a monthly feature of CHEMISTRY magazine. Written by Burton L. Hawk . . . and designed for a simple but adequate home labo[illegible]ch real chemical preparations can be made.



The World We Live In
The Air We Breathe
The Water We Drink
The Food We Eat
The Clothing We Wear
The Coins We Spend
The Drugs We Take
Lesser-Known Elements We Study
Other Materials We Use

A PRACTICAL INTRODUCTION TO THE CHEMISTRY OF EVERYDAY THINGS

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7-18-53

Do You Know?

Giant *clams* on the barrier reefs off Australia commonly reach 3.5 feet in length and weigh almost 400 pounds.

There is no group of *fishes* officially called "sardine"; the U. S. herring, the menhaden and the European pilchard are the small fishes that usually fill sardine cans.

Milk offers more *food* for the money than many available food materials.

Twenty-five fire watchers in towers scattered through Idaho and Montana are serving as part-time cloud and weather observers to provide data that may help reduce lightning *fires*.

Termites live in self-contained communities; one of their mounds found in Northern Rhodesia was 20 feet high and at least 40 feet in diameter.